Mobile Phones, Mobility Practices, and Transport Organization in Sub-Saharan Africa

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Information and communication technologies (ICTs)—in particular, mobile phones—are rapidly changing the face of Africa. A growing literature shows how these technologies are reshaping the way business is done, the way social networks are built and maintained, even the conduct of romantic courtship. However, the implications of mobile phone usage for current and potential patterns of *physical* mobility and associated organization of transport services in sub-Saharan Africa—the focus of this article—are just starting to attract attention. After a brief review of the scale and nature of mobile phone expansion, this article will consider evidence of current linkages between mobile phone usage and physical mobility, including social equity implications; comparisons with studies in Western contexts are made where appropriate. Some reflections regarding the potential that mobile phones may offer for improved transport planning follow as well. In addition to engaging with the limited published material available to date, this article draws on my personal research into physical mobility, transport, and mobile phones, as well as related experience as transport services adviser to the U.K. Department for International Development's Africa Community Access Programme (AFCAP), under which various relevant transport studies are being conducted.[1]

A brief history of mobile phone diffusion across Africa

In the history of Africa, the mobile phone arguably ranks well ahead of other communications technologies such as the landline, telegraph, radio, television, or newspapers in terms of its reach and impact. Its wide range makes it similar to the earlier diffusion of motor vehicles and associated road construction.[2] In contrast to landline usage, which has been severely limited by inadequate infrastructure, poverty, and widespread corruption in the

telecommunications sector, the pace of adoption of mobile telephony is remarkable.[3] Africa's first mobile phone call was only made in 1987,[4] yet the World Bank's 2012–13 Africa Development Indicators report suggests that over 80 percent of urban people in Africa now have access to cell phones. This may be an underestimate. Subscription figures do not equate with phone *access*, since phones are shared regularly and widely with family, friends, and neighbors. In Malawi, for instance, the growth from 0.9 subscribers per 100 people in 2000 to 21.5 in 2010 does not adequately reflect the levels of (albeit occasional) access now enjoyed even among very poor people in remote rural locations.[5]

Competition between network providers has often been instrumental in bringing down call costs, encouraging regular phone communication among even the very poor. The availability of increasingly cheap Chinese handsets supports this trend. Meanwhile, Africans are remaking the mobile phone to suit local contexts, from building their own phones to establishing Afro-driven innovation hubs or platforms, and from innovative use of airtime for money transfers (promoting development of M-Pesa in Kenya, a precursor to mobile money worldwide) to local phone etiquettes.[6]

Two recent developments—the embrace of mobile money and smartphones—have particular pertinence for physical mobility practices. In a continent where relatively few people have bank accounts, phone-enabled money transfers offer a quick, secure, and cost-effective way to move money (including across national borders) without requiring personal travel. This has had remarkable success across a growing number of African countries, following M-Pesa's commercial launch in 2007.[7] In Tanzania, for instance, by October 2012 mobile money use had reportedly reached 45 percent of the adult population.[8]

The growth of broadband access, and associated smartphone ownership as handset prices continue to fall rapidly, is a second trend with implications for physical mobility practices. The vast majority of Internet use in Africa is currently via mobile phones; mobile

broadband penetration reportedly increased from 2 percent in 2010 to an estimated 11 percent in 2013, the world's highest regional growth rate in the last three years.[9] Young people have joined social networking sites with alacrity using smartphones (by 2010 there were approximately 10.5 million Facebook users across Africa).[10] A wide range of other new opportunities, from business, education, and health applications to civic activism, are now becoming available through this medium.[11]

Implications of growing mobile phone usage for daily and longer-distance mobilities

In Western contexts, there has been particular interest in the extent to which trip making, and thus traffic volumes, would reduce as ICT usage expanded. However, despite early hopes among many policy makers of potentially beneficial environmental changes resulting from the spatial reorganization of daily mobilities, there is no strong evidence to date that this is the case: rather, physical "corporeal" travel may expand, since the portability of mobile phones presents new opportunities to reschedule on the move.[12] The situation may be different in sub-Saharan Africa, whether considering social or business interactions. For instance, although personalized relationships are widely considered to be highly crucial in business settings, widespread poverty, irregular transport availability, and potentially hazardous journeys on poor roads in badly maintained vehicles, with added risks of harassment and extortion (from highway robbers, police, etc.), may weigh more strongly in balancing virtual versus physical mobility. A number of (mostly business-focused) studies offer some evidence of respondents reducing their travel as a result of mobile phone communication, often with associated reference to the low cost of phone messaging and calls and comparisons drawn to the high costs of travel in terms of money and time expended and associated risks.[13] Similar narratives emerge in a study of young people's mobility in what are mostly "social" rather than business contexts, though this communication is still often

imbued with material implications and expectations.[14] Again, respondents weigh the benefits of a phone call versus financial and time costs and potential travel risks. The ability to leapfrog distances encourages new forms of interaction as users creatively appropriate the new technology to fit life's changing circumstances. However, with reference to Urry's reflections on physical copresence in Western contexts, the need for occasional face-to-face meetings to sustain the trust and tacit knowledge essential to maintaining relationships may arguably draw a bottom line on such mobility substitutions (whether for business or social interaction), and, of course, it is still necessary to take goods to market.[15]

Potentially less positive aspects of reduced travel are also emerging in some contexts. In a study of older people's mobility in rural Tanzania, the benefits of mobile money received from city-based children were recognized, but some elders regretted the reduction in face-to-face contact that often accompanied this form of exchange.[16] Similar difficulties around reduced face-to-face contact are emerging among a small but significant group of young people, including some of the most vulnerable living at a distance from their families.[17]

Despite many possible advantages from reduced travel in Africa, some elements of mobile phone usage may encourage *increased* travel. For instance, information is more likely now to arrive in time to enable attendance at important occasions such as funerals, and phone-enabled remittances can help cover associated transport costs.[18] Social networking may also be a starting point for longer-distance journeys. Burrell reflects on young people's PC Internet usage in Accra and concludes that the Internet is providing new resources for seeking migration opportunities and increasing personal mobility.[19] Across Africa, there are young people linking regularly to "friends" across the world and locally.[20] In many cases they meet virtually with strangers, often as part of a wider search for resources and other opportunities, as reported by Burrell. For some these virtual meetings eventually lead to face-to-face contact, which can have both positive and negative outcomes. As a proportion of total

social network interactions, such meetings are probably relatively rare. Nonetheless, the point remains that when mobile phones vastly expand the size of an individual's social or business networks, they are likely to create a need for new face-to-face meetings across this larger group of connections and thus require, overall, more travel.[21]

Social equity, mobility, and ICTs

Social equity issues form a significant backdrop to the earlier discussion. The gender- and age-related mobility implications of mobile phone use, in particular, will need careful monitoring and further explication over time, as patterns of phone ownership develop and change. For instance, although boys often seem to start with higher levels of phone ownership than girls, girls may subsequently achieve higher ownership than boys.[22] The implications of expanded virtual mobility in terms of girls' and women's empowerment through access to new educational, economic, health, social, and political information and opportunities are exciting, because African women and girls are still so often restricted in their physical travel.[23] However, how this works out in practice remains to be seen. A mix of gains and losses seems more likely.

In Finland, Taipale suggests that even if many women may lack economic capital they are nonetheless at the "cutting edge" in their combined use of corporeal mobilities and ICTs. He also notes that this serves women's continuing role "as the maintainers of the domestic sphere," thus not necessarily an entirely positive development, given the time burden of women's common dual roles.[24] But perhaps, in Africa, women and girls with less opportunity to travel will gain more from virtual networks than their Finnish counterparts.

Taipale also presents evidence from urban Finland to show that young people are the age group most likely to use mobile phones and other ICTs extensively. He shows that by connecting ICT use with urban public transport availability, these users have developed a

"versatile reservoir of mobilities."[25] Across Africa, as in Finland, youth are in the vanguard of mobile phone adoption, practice, and expertise, but their potential to tie this so neatly to physical mobility performances may be more constrained, especially in the absence of cheap, reliable public transport. Moreover, young girls often do not have the freedom, flexibility, or resources to travel spontaneously and may well already have parenting commitments. However, for both genders, virtual and physical mobility practices are likely to change as they age, shaped partly by interactions between peers in the same age cohort and cross-generationally.

Burrell's work is an early pointer to the increasingly complex interactions we are likely to see generated across ethnic and international boundaries, as interconnections between social networks, physical mobility, and ICTs extend.[26] A series of ongoing ethnographic studies of mobile telephony, including in the lives of nomadic peoples and in conflict contexts, should throw further light on the ways in which physical and virtual mobilities interconnect.[27]

Transport services in an era of new connectivities

Finally, brief comment is required regarding how new connectivities are being enabled in Africa as mobile phones connect directly to transport operations and operators. These changes are already dramatically altering the lives of many poor people. Inhabitants of remote off-road villages in rural Tanzania, for instance, can now call a local motorcycle taxi with numbers already saved on their phones and be traveling toward the nearest major road to pick up an intercity bus in a matter of minutes.[28] If the bus breaks down en route to town, they can call their family to warn of a late arrival or their trading partner to advise of a delay in the receipt of goods. The young person traveling to visit a relative in town will use their

phone to check directions, or sometimes even to call the relative to find and guide them to the house.[29]

All this is happening spontaneously, between individuals, without external intervention. However, recent experiments in Abidjan show how public transport itself can be reorganized more efficiently by utilizing phone information, such that travel times could be reduced by 10 percent across the city.[30] Although this is only pilot research, it indicates the potential for transport planners to engage with operators and customers to build much more connected, socially equitable, and environmentally sustainable travel systems. In the context of an increasingly carbon-constrained world, this is enterprise clearly worthy of further investigation.

Conclusion

The implications of emerging intersections between virtual and physical mobility—and broader interactions with wider social, economic, and political contexts—offer fascinating new research foci. It is likely that mobile phone usage will continue to be complexly interwoven with physical mobility and, increasingly, with transport technologies and that, over time, those patterns of interweaving will regularly reshape and reform. Conditions are changing very rapidly, as an ever-wider sector of the population obtains phone access, as competencies associated with phone usage and applications expand, as the facilities and applications available to phone users grow, as private sector network operators change their marketing strategies, and perhaps also as governments alter the regulatory frameworks under which operators must conduct business. Further complexity is also likely to emanate from the transport services sector (changes in prevailing transport costs and modes associated with fluctuations in fuel prices and fuel availability, development of new fuels, etc.), and from wider cultural, political, and environmental developments yet to be identified, some of which

may be brought about as a result of mobile phone usage itself. Clearly, the mobile phone is transforming African mobile lives at a variety of scales, from the minutiae of individual spatial orientations to expansive global connectivities. The implications for Africans and African development are potentially enormous.

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Notes

[1] See www.afcap.org.

[2] Gina Porter, "Reflections on a Century of Road Transport Developments in West Africa and Their (Gendered) Impacts on the Rural Poor," *EchoGeo* 20 (April–June 2012), http://echogeo.revues.org/13116 Last accessed 18th July 2014

[3] Manuel Castells et al., *Mobile Communication and Society: A Global Perspective* (Cambridge, MA: MIT Press, 2007); J. O. Adeoti and I. A. Adeoti, "Easing the Burden of Fixed Telephone Lines on Small-Scale Entrepreneurs in Nigeria: GSM Lines to the Rescue," *Telematics and Informatics* 25 (2008): 1–18; Sebastiana Etzo and Guy Collender, "Briefing: The Mobile Phone 'Revolution' in Africa: Rhetoric or Reality?," *African Affairs* 109, no. 437 (2010): 659–668; International Telecommunication Union (ITU), *Information Society Statistical Profiles: 2009 Africa* (Geneva: International Telecommunications Union, 2009).

[4] Coyle, D: Overview, p. 3 in *Africa: The Impact of Mobile Phones*, Moving the Debate Forward: The Vodafone Policy Paper Series 2 (2005) p. 3.

http://www.vodafone.com/content/dam/vodafone/about/public_policy/policy_papers/public_policy_series_2.pdf Last accessed 18th July 2014.

[5] Here (and subsequently) I draw on personal observations during fieldwork conducted between 2007 and 2014 within two three-country research studies (across the same twenty-four sites), funded by the U.K. Economic and Social Research Council and the U.K. Department for International Development (ES/J018082/1 and RES-167-25-0028). See www.dur.ac.uk/child.mobility/ and www.dur.ac.uk/child.phones/ for further information. The still-ongoing study, "Mobile Phones and Youth in Africa," is a collaboration between staff from Durham University in the U.K. and the University of Cape Coast in Ghana, the University of Malawi, the University of Cape Town, and Walter Sisulu University in South Africa.

[6] *Daily Independent*, "Two Made-in-Nigeria Mobile Phones for Launch," http://dailyindependentnig.com/2013/10/two-made-in-nigeria-mobile-phones-for-launch-nov/ **(**accessed 22 April 2014); iHub website, http://www.ihub.co.ke/about; Abebe Zegeye and Robert Muponde, eds., "Social Lives of Mobile Telephony," special issue, *African Identities* 10, no. 2 (2012).

[7] Bill Maurer, "Mobile Money: Communication, Consumption and Change in the Payments Space," *Journal of Development Studies* 48, no. 5 (2012): 589–604.

[8] Michelle Kaffenberger and Sidra Butt, "Mobile Money: A Path to Financial Inclusion: Findings from the Tanzania Mobile Money Tracker Study," *InterMedia,* April 2013.

[9] Michael Bratton, "Briefing: Citizens and Cell Phones in Africa," *African Affairs* 112, no. 447 (2011): 304–319; ITU News, "Mobile Subscriptions Near the 7-Billion Mark: Does Almost Everyone Have a Phone?," 6 August 2013, https://itunews.itu.int/En/3741-Mobile-subscriptions-near-the-78209billion-markbrDoes-almost-everyone-have-a-phone.note.aspx (accessed 22 April 2014).

[10] Facebook statistics from Socialbakers, a company that provides social media network statistics and analysis; see http://www.socialbakers.com/.

[11] See, e.g., Nicholas Alozie, Patience Akpan-Obong, and William Foster, "Sizing Up Information and Communication Technologies as Agents of Political Development in Sub-Saharan Africa," *Telecommunications Policy* 35 (2011): 752–763.

[12] Mei-Po Kwan, "Transport Geography in the Age of Mobile Communications," *Journal of Transport Geography* 14 (2006): 384–385; Tilly Line, Juliet Jain, and Glenn Lyons, "The Role of ICTs in Everyday Mobile Lives," *Journal of Transport Geography* 19, no. 6 (2011): 1490–1499; Randi Hjorthol, "The Mobile Phone as a Tool in Family Life: Impact on Planning of Everyday Activities and Car Use," *Transport Reviews* 28 (2008): 303–320; Claudia Nobis and Barbara Lenz, "Communication and Mobility Behaviour: A Trend and Panel Analysis of the Correlation between Mobile Phone Use and Mobility," *Journal of Transport Geography* 17 (2009): 93–103; Sakari Taipale, "The Dimensions of Mobilities: The Spatial Relationships between Corporeal and Digital Mobilities," *Social Science Research* 43 (2013): 157–167.

[13] See Jonathan Samuel, Niraj Shah, and Wenona Hadingham, *Mobile Communications in South Africa, Tanzania, and Egypt: Results from Community and Business Surveys*. In *Africa: The Impact of Mobile Phones* Moving the Debate Forward: The Vodafone Policy Paper Series 2 (2005) pp. 44-52: http://www.vodafone.com/content/dam/vodafone/about/public_policy/policy_papers/public_policy_series_2.pdf last accessed 18th July 2014 ; Abi Jagun, Richard Heeks, and Jason Whalley, "The Impact of Mobile Telephony on Developing Country Microenterprise: A Nigerian Case Study," *Information Technologies and International Development* 4 (2008): 47–65; Olga Morawczynski, "Exploring the Usage and Impact of 'Transformational' Mobile Financial Services: The Case of M-PESA in Kenya," *Journal of Eastern African Studies* 3

(2009): 509–525; Jenny Aker and Isaac Mbiti, *Mobile Phones and Economic Development in Africa*, Working Paper 211 (Washington, D.C.: Center for Global Development, 2010); Ebikobowei Baro and Benake-ebide Endouware, "The Effects of Mobile Phone on the Socio-economic Life of the Rural Dwellers in the Niger Delta Region of Nigeria," *Information Technology for Development* 19, no. 3 (2013): 249–263. Most are reviewed in Gina Porter, "Mobile Phones, Livelihoods and the Poor in Sub-Saharan: Review and Prospect," *Geography Compass* 6 (2012): 241–259; for recent/ongoing studies by Kendat, Plymouth University, HelpAge International, and other groups, see www.afcap.org.

[14] Gina Porter et al., "Youth, Mobility and Mobile Phones in Africa: Findings from a Three-Country Study," *Journal of Information Technology for Development* 18, no. 2 (2012): 145–162.

[15] John Urry, "Mobility and Proximity," *Sociology* 36 (2002): 255–274; John Urry, *Mobilities* (Cambridge: Polity Press, 2007); John Urry, "Social Networks, Mobile Lives and Social Inequalities," *Journal of Transport Geography* 21 (2012): 24–30; Sanna Tawah, "Market Women and Mobile Phones in the North West Region of Cameroon: Managing Informal Market Livelihoods and Trade Routes through Mobile Phones," *Suomen Antropologi* 38, no. 1 (2013): 59–82.

[16] Gina Porter et al., "Transport and Mobility Constraints in an Aging Population: Health and Livelihood Implications in Rural Tanzania," *Journal of Transport Geography* 30 (2013): 161–169.

[17] Observations from research in progress in the current 24-site study, "Mobile Phones and Youth in Africa," led by the author; see www.dur.ac.uk/child.phones/.

[18] Miriam De Bruijn, Inge Brikman, and Francis Nyamnjoh, "Introduction," in *Side@ways: Mobile Margins and the Dynamics of Communication in Africa*, ed. Miriam De Bruijn, Inge Brikman, and Francis Nyamnjoh (Bamenda, Cameroon: Langaa; Leiden: African Studies

Centre, 2013), 1–16; Henrietta Nyamnjoh, "Information and Communication Technology and its Impact on Transnational Migration: The Case of Senegalese Boat Migrants," in De Bruijn, Brikman, and Nyamnjoh, *Side@ways*, 159–177.

[19] Jenna Burrell, "Could Connectivity Replace Mobility? An Analysis of Internet Café Use Patterns in Accra, Ghana," in *Mobile Phones: The New Talking Drums of Everyday Africa*, ed. Miriam De Bruijn, Frances Nyamnjoh, and Inge Brinkman (Bamenda, Cameroon: Langaa; Leiden: African Studies Centre, 2009).

[20] Gina Porter et al., "Mobile Phones, Social Organisation and Independent Transitions among Young People in Sub-Saharan Africa: Mobilities Perspectives," paper presented at the World Social Science Forum, Montreal, 13 October 2013.

[21] Ann Aguilera, Caroline Guillot, and Alain Rallet, "Mobile ICTs and Physical Mobility: Review and Research Agenda," *Transportation Research Part A* 46 (2012): 664–672.

[22] Porter et al., "Youth, Mobility and Mobile Phones in Africa," 145–162.

[23] Gina Porter, "'I think a woman who travels a lot is befriending other men and that's why she travels': Mobility Constraints and Their Implications for Rural Women and Girl Children in Sub-Saharan Africa," *Gender, Place and Culture* 18, no. 1 (2011): 65–81.

[24] Taipale, "The Dimensions of Mobilities," 157–167.

[25] Ibid.

[26] Burrell, "Could Connectivity Replace Mobility?"

[27] De Bruijn, Brikman, and Nyamnjoh, *Side@ways*; http://mobileafricarevisited.wordpress.com/; http://www.connecting-in-times-of-duress.nl/

[28] Porter et al., "Transport and Mobility Constraints in an Aging Population."

[29] Fieldwork in progress, see www.dur.ac./child.phones/; see also www.afcap.org.

[30] BBC News, "Mobile Phone Data Redraws Bus Routes in Africa," 1 May 2013, http://www.bbc.co.uk/news/technology-22357748 (accessed 25 April 2014).